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# Basin Outlook Reports

## and Federal - State - Private Cooperative Snow Surveys

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*For more water supply and resource management information, contact:*

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### *How forecasts are made*

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points.

Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

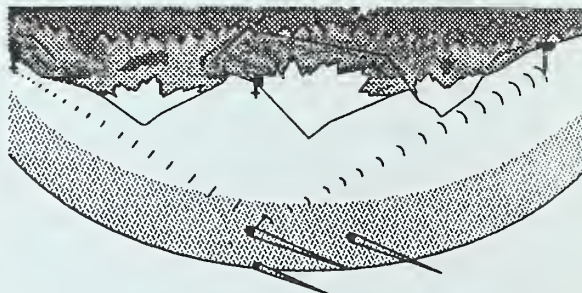
Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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Agriculture  
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## Basin Outlook Reports

In addition to basin outlook reports, a Water Supply Forecast for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209-3489.

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# WASHINGTON

JUNE 1991

## GENERAL OUTLOOK

### SUMMARY:

JUNE 1, 1991: FORECASTS FOR 1991 RUNOFF VARY FROM 160% OF AVERAGE FOR THE SIMILKAMEEN RIVER TO 72% ON STEMILT CREEK IN THE WENATCHEE BASIN. THE SNOWPACK IS GONE FROM THE LOW ELEVATION SNOW COURSES, AND 18 OF THE 37 SNOTEL SITES ARE BARE. SNOWPACK VARIES FROM 0% IN THE WALLA WALLA BASIN TO 182% IN THE CHELAN BASIN. WASHINGTON'S SNOTEL SITES ARE AVERAGING 108% OF NORMAL SNOWPACK ON JUNE 1. MAY STREAMFLOWS VARIED FROM 181% OF NORMAL ON THE OKANOGAN RIVER TO 60% ON THE YAKIMA RIVER. MAY PRECIPITATION WAS 151% OF NORMAL STATE WIDE, AND VARIED FROM 530% OF AVERAGE IN THE WALLA WALLA BASIN TO 79% IN THE YAKIMA BASIN. YEAR-TO-DATE PRECIPITATION VARIES FROM 95% IN THE COLVILLE TO 146% IN THE WENATCHEE - CHELAN BASINS. MAY TEMPERATURES WERE BELOW NORMAL AND VARIED FROM THREE DEGREES BELOW IN THE WALLA WALLA BASIN TO NORMAL IN THE OKANOGAN BASIN. JUNE 1 RESERVOIR STORAGE IS GENERALLY GOOD THROUGHOUT THE STATE, WITH RESERVOIRS IN THE YAKIMA BASIN AT 112% OF AVERAGE AND 98% OF CAPACITY.

### SNOWPACK:

Cool days and cold nights, kept the snowpack at the higher elevations in Washington. Snowpack varies over the state from 182% of normal in the Chelan Basin to patches on the north slopes in the Walla Walla Basin. The Yakima Basin is now at 82%. Snowpack along the west slopes of the Cascade Mountains includes the White with 130%, the Cowlitz Basin with 71%, and the Skagit 175%. Snowpack in the Wenatchee Basin is 132% of normal; the Okanogan at 144%, and the Spokane at 108%. SNOTEL sites in Washington are showing state-wide snowpack 107% of average for June 1. Maximum snow cover is at Lyman Lake SNOTEL in the Chelan River drainage, with a water content of 84.4 inches. This site would normally have 47.6 inches of water content on June 1.

## PRECIPITATION:

Southwest Washington made a good effort to catch up on precipitation during May. Over 6.6 inches of rain was measured at the Walla Walla weather station. Washington had many rainfall events throughout the month of May. May precipitation varied from 530% of average in the Walla Walla Basin, to 79% in the Yakima Basin. Precipitation at National Weather Service stations was 151% of average statewide. The year-to-date precipitation statewide is 114% and varied from 146% of normal in the Wenatchee - Chelan Basin to 95% in the Colville-Pend Oreille Basin. SNOTEL sites in Washington showed high elevation year-to-date precipitation values to be 117% of normal. Maximum year-to-date precipitation was at the June Lake SNOTEL site near Mt. St. Helens, with 174.2 inches since October 1, 1990; normal for this site would be 150.0 inches.

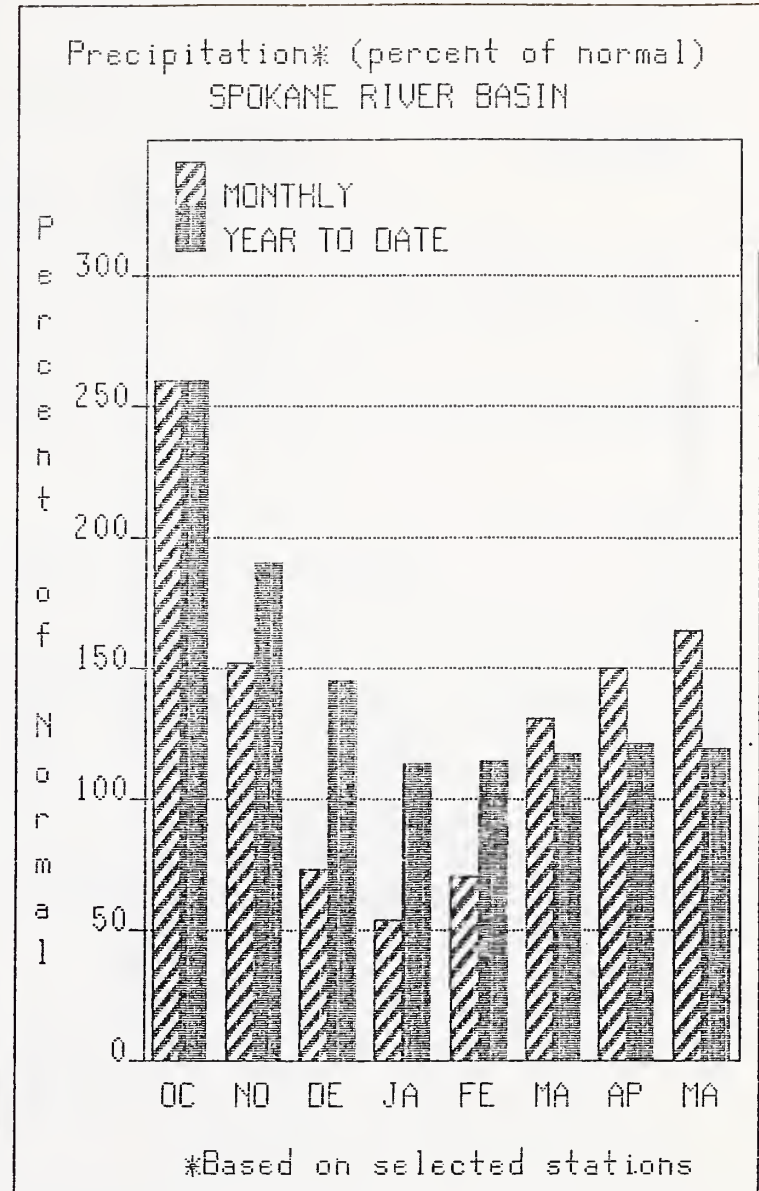
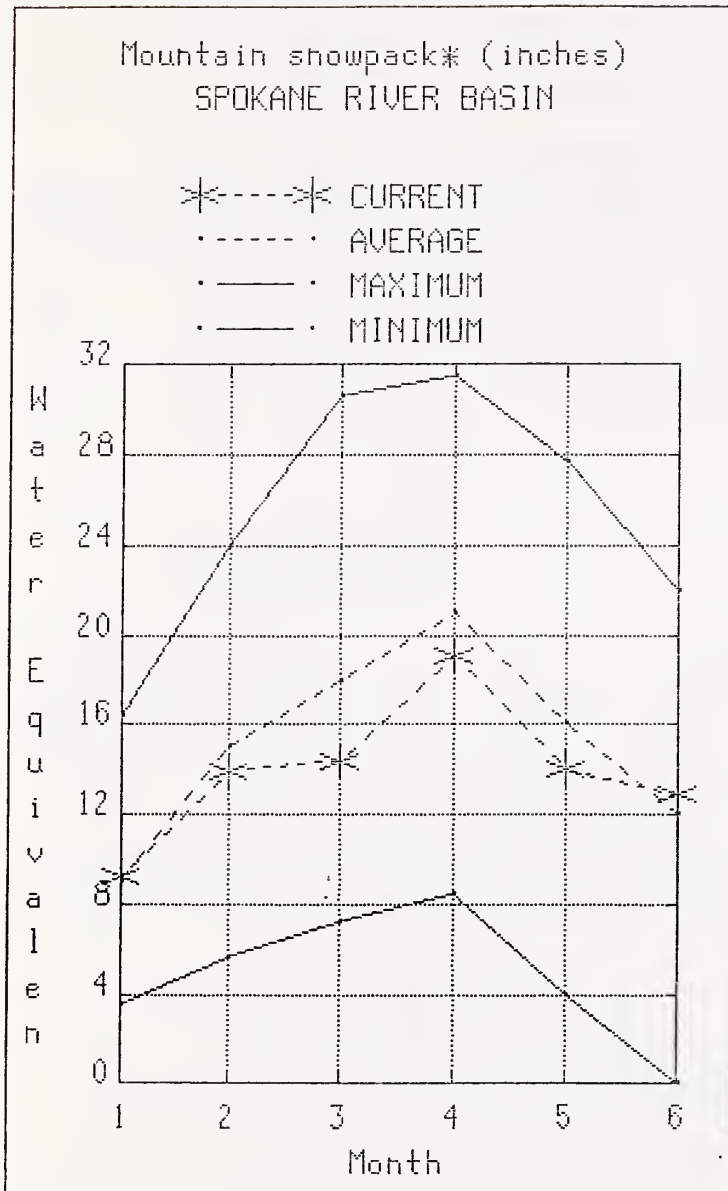
## RESERVOIRS:

Reservoir storage in Washington continues good, with storage above average for June 1. Reservoir storage in the Yakima Basin was 1,047,300 acre feet, 112% of normal. Storage at other reservoirs include Roosevelt at 92% of average, and filling rapidly and the Okanogan reservoirs at 118% of June 1 normal. The power generation reservoirs contain the following: Coeur d'Alene Lake, 296,200 acre feet, or 84% of normal; Chelan Lake, 547,400 acre feet, 121% of average and 81% of capacity, and Ross Lake at 84% of average, and 62% of capacity.

## STREAMFLOW:

May streamflows were generally above average in northern Washington, and below average in southern Washington. Washington Rivers had the following percent of normal streamflow; the Lewis River, 77%; the Walla Walla River, 137%; the Spokane River, 92%; the Columbia at the Canadian border, 115%. The Pend Oreille River at 106% and the Methow with 119% continued high. The Okanogan River was the highest in the state, at 181%, and the Similkameen River was 178%. Forecasts for summer streamflow are similar to last month and vary from 160% of average for the Similkameen River to 72% of normal on Stemilt Creek in the Wenatchee River Basin. April forecasts for some west side streams include: Cedar River, 102%; Skagit River, 135%; and the Dungeness River, 91%. Some east side streams include the Yakima River at Parker 78%; the Wenatchee River at Peshastin, 110%; and the Okanogan River, 140%.

# SPOKANE



## WATER SUPPLY OUTLOOK:

The June 1 forecasts for summer runoff within the Spokane River Basin is 110% of normal. This is up from 99% last month. The forecast is based on a snowpack 108% of average and a water year-to-date precipitation value 119% of normal. Precipitation for May was 164% of average. Temperatures in the basin were two degrees below normal during May. Streamflow on the Spokane River was 92% of normal for May. June 1 storage in Coeur d'Alene Lake was 296,200 acre feet, 84% of normal.

For more information contact your local Soil Conservation Service office.



# SPOKANE RIVER BASIN

## STREAMFLOW FORECASTS

		<----- DRIER ----- FUTURE CONDITIONS ----- WETTER ----->						
FORECAST POINT	FORECAST PERIOD	CHANCE OF EXCEEDING *						25 YR. (1000AF)
		90%	70%	50% (MOST PROBABLE)		30%	10%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)	
SPOKANE nr Post Falls (1,2) ++	JUN-SEP	690	850	920	110	990	1150	835
	JUN-JUL	605	745	810	110	875	1010	737
SPOKANE at Long Lake (2) ++	JUN-JUL	765	900	990	109	1080	1220	911

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
		THIS YEAR	LAST YEAR	AVG.			
COEUR D'ALENE	291.2	296.2	321.2	353.9	Spokane River	5	118

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.  
 ++ National Weather Service Earlybird forecast value.

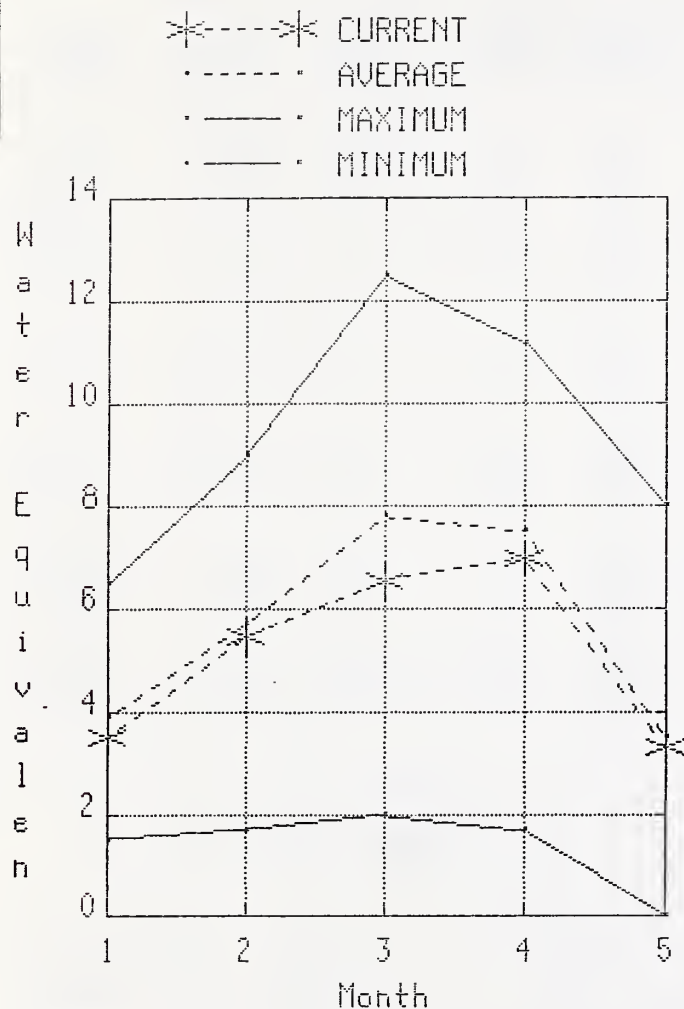
The average is computed for the 1961-1985 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.

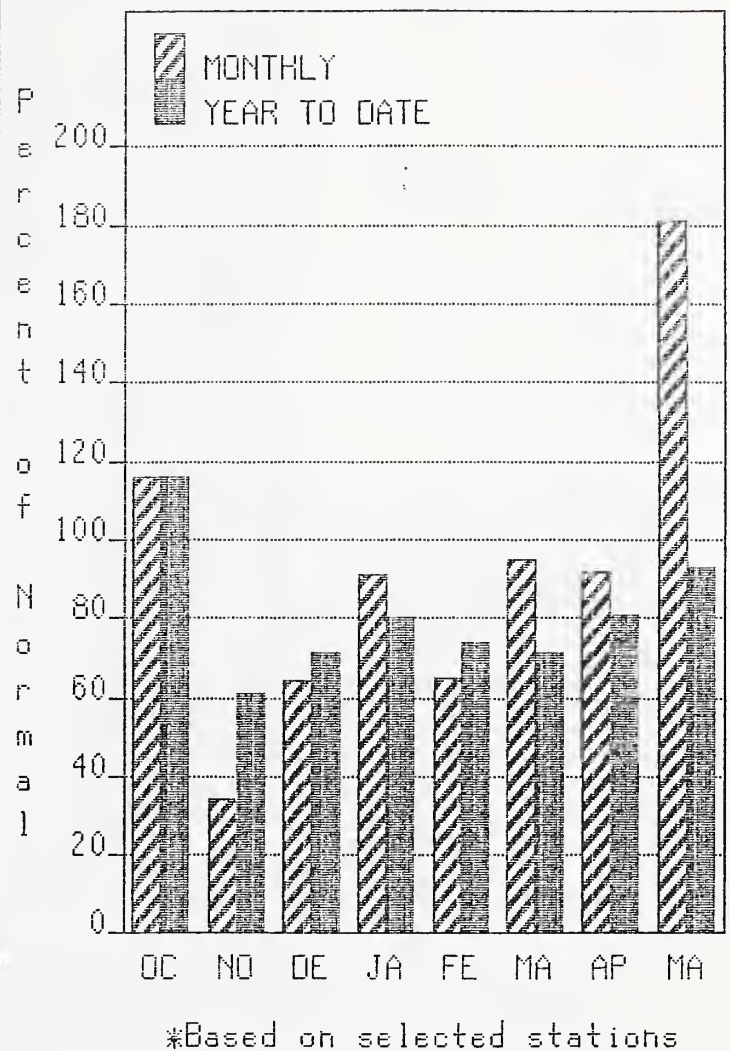


# COLVILLE - PEND OREILLE

Mountain snowpack\* (inches)  
COLVILLE - PEND OREILLE RIVER BASIN



Precipitation\* (percent of normal)  
COLVILLE - PEND OREILLE RIVER BASINS



## WATER SUPPLY OUTLOOK:

Precipitation during May was 149% of average, bringing the water year-to-date to 95% of normal. June 1 snow cover is 103% of average on the Pend Oreille, and 118% on the Kettle. Snowpack at Bunchgrass Meadow SNOTEL site was 11.8 inches of water, the average June 1 reading is 8.6. May streamflow was 106% of normal on the Pend Oreille River, 115% on the Columbia at the International Boundary, and 100% on the Kettle River. The earlybird forecast for the Columbia River streamflow is 118% of normal, the Pend Oreille 100%, and the Colville River, 79% of normal for the summer runoff period. Temperatures were one degree below normal for May.

For more information contact your local Soil Conservation Service Office.

# COLVILLE - PEND OREILLE RIVER BASINS

## STREAMFLOW FORECASTS

		<----- DRIER -----		FUTURE CONDITIONS		----- WETTER ----->			
FORECAST POINT	FORECAST PERIOD	CHANCE OF EXCEEDING *						25 YR. (1000AF)	
		90% (1000AF)	70% (1000AF)	50% (MOST PROBABLE) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)		
PEND OREILLE bl Box Canyon (1,2) ++	JUN-SEP	5560	7410	8250	100	9090	10900	8250	
	JUN-JUL	4520	6200	6960	100	7720	9400	6982	
CHAMOKANE CK nr Long Lake ++	MAY-AUG	2.6	5.4	7.4	67	9.4	12.2	11.1	
	JUL-AUG	2.5	2.8	2.9	78	3.0	3.3	3.7	
COLVILLE at Kettle Falls ++	JUN-SEP	20	28	33	79	38	46	42	
	JUN-JUL	12.0	19.0	23	77	27	34	30	
KETTLE nr Laurier ++	JUN-SEP	730	835	905	102	975	1080	889	
	JUN-JUL	645	740	800	101	865	955	790	
COLUMBIA at Birchbank (1,2) ++	JUN-SEP	34100	36900	38100	118	39300	42100	32410	
	JUN-JUL	24400	26500	27500	117	28500	30600	23470	
COLUMBIA at Grand Coulee Dm (1,2) ++	JUN-SEP	44500	48400	50100	116	51800	55700	43300	
	JUN-JUL	33400	36600	38000	117	39400	42600	32570	

## RESERVOIR STORAGE

(1000AF)

## WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE : CAPACITY :	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
		THIS	LAST				-----	
		YEAR	YEAR	AVG.			LAST YR.	AVERAGE
ROOSEVELT	5232.0	2630.3	2921.6	2851.0	Colville River	0	0	0
BANKS	NO REPORT				Pend Oreille River	4	117	103
					Kettle River	2	295	118

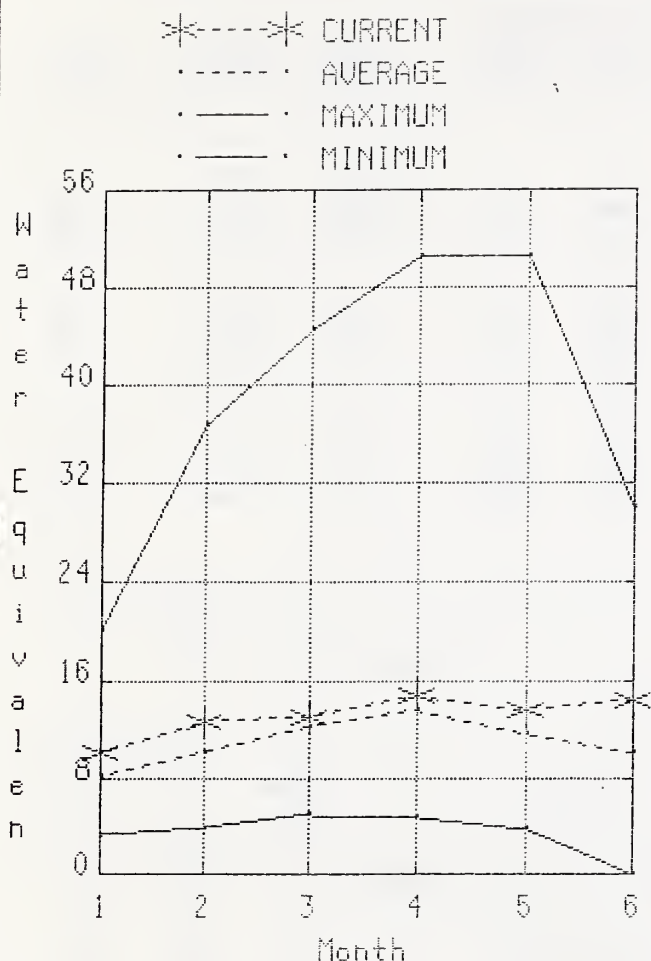
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.  
 ++ National Weather Service Earlybird forecast value.

The average is computed for the 1961-1985 base period.

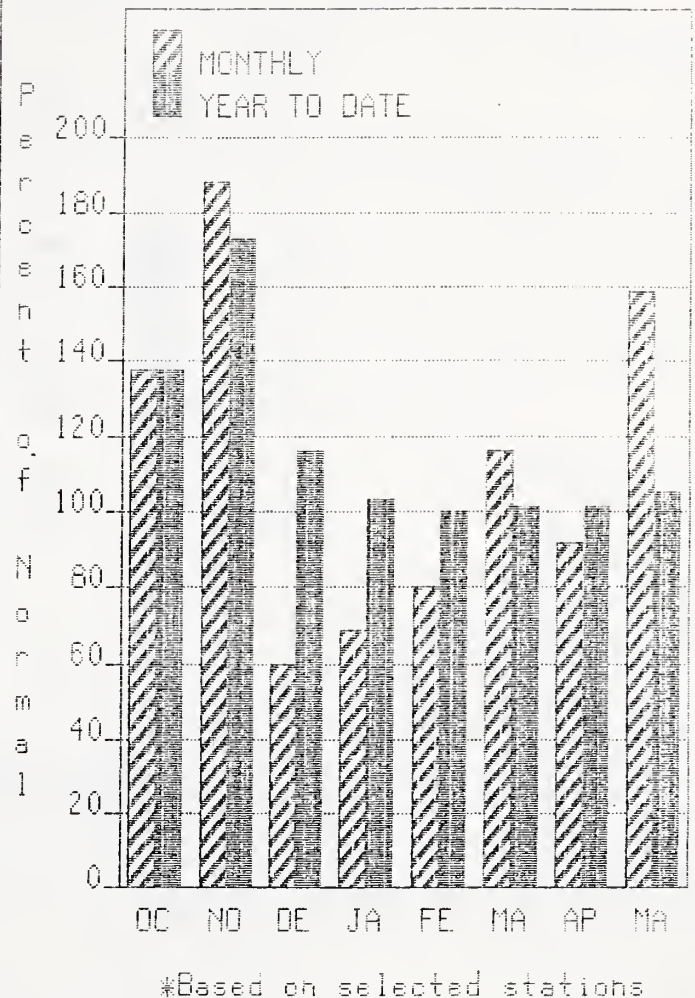
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.

# OKANOGAN AND METHOW

Mountain snowpack\* (inches)  
OKANOGAN - METHOW RIVER BASINS



Precipitation\* (percent of normal)  
OKANOGAN - METHOW RIVER BASINS



## WATER SUPPLY OUTLOOK:

June 1 snow cover was 178% for the Methow Basin, and 144% of average on the Okanogan. May precipitation in the Okanogan-Methow was 141% of normal, with water year-to-date 112% of average. May streamflow on the Methow River was 119% of normal, 181% on the Okanogan River, and 178% on the Similkameen. Some flooding has occurred along the Similkameen and Okanogan Rivers as the runoff from rain combined with melt from a heavy high elevation snowpack. Summer runoff for the area's small streams is expected to be below normal. Snow water content at the Harts Pass SNOTEL, elevation 6500 feet, was 63.7 inches of water content in the pack. Summer runoff forecast for the Okanogan River is 140% of normal; the Similkameen River, 160%, the highest in the state; and the Methow River, 120% of normal. Temperatures were normal for the month. Storage in the Conconully Reservoirs is 21,200 acre feet, which is 90% of capacity and 118% of June 1 average.

For more information contact your local Soil Conservation Service office.



# OKANOGAN - METHOW RIVER BASINS

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	<div style="display: flex; justify-content: space-between; align-items: center;"> <span>&lt;----- DRIER -----</span> <span>FUTURE CONDITIONS</span> <span>----- WETTER -----&gt;</span> </div>						
		CHANCE OF EXCEEDING *						
		90% (1000AF)	70% (1000AF)	50% (MOST PROBABLE) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	25 YR. (1000AF)
SIMILKAMEEN nr Nighthawk ++	MAY-SEP	2030	2110	2160	161	2210	2290	1345
	MAY-JUL	1870	1950	2000	161	2050	2130	1246
	MAY-JUN	1600	1650	1680	161	1710	1760	1042
OKANOGAN RIVER nr Tonasket ++	MAY-SEP	1760	1990	2140	140	2290	2520	1529
	MAY-JUL	1590	1790	1920	140	2050	2250	1368
	MAY-JUN	1310	1470	1580	141	1690	1850	1124
METHOW RIVER nr Pateros ++	MAY-SEP	945	1020	1080	120	1140	1220	898
	MAY-JUL	860	940	990	120	1040	1120	824
	MAY-JUN	700	775	825	120	875	950	688

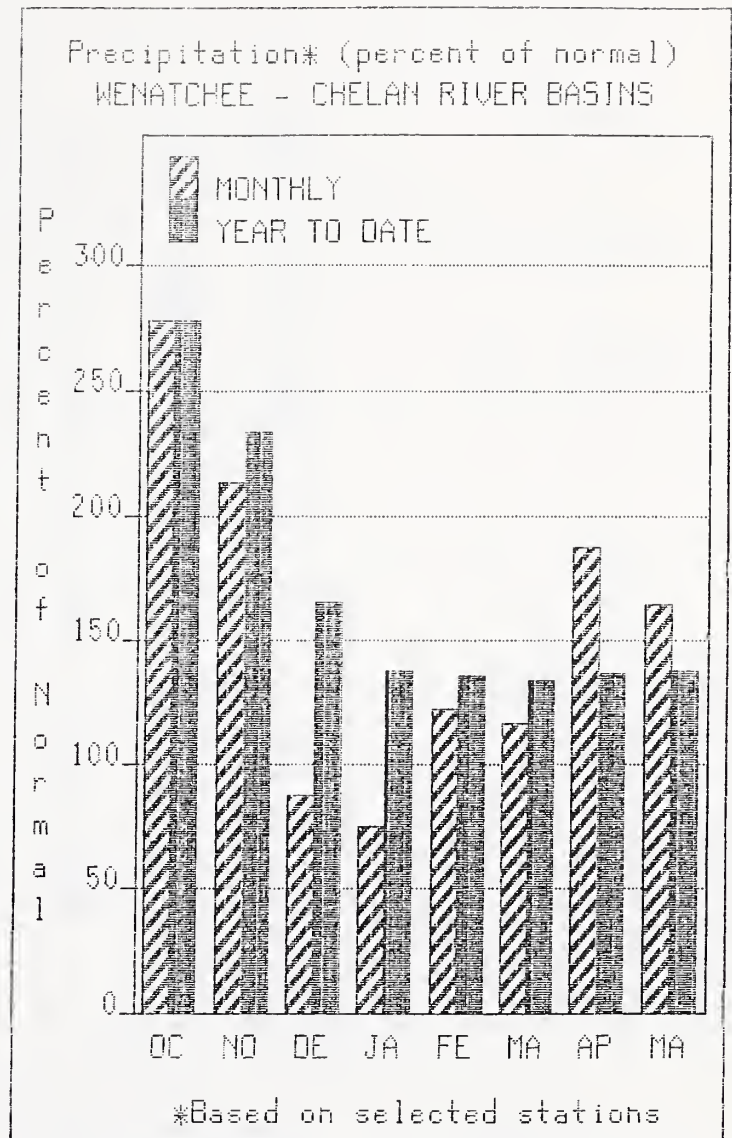
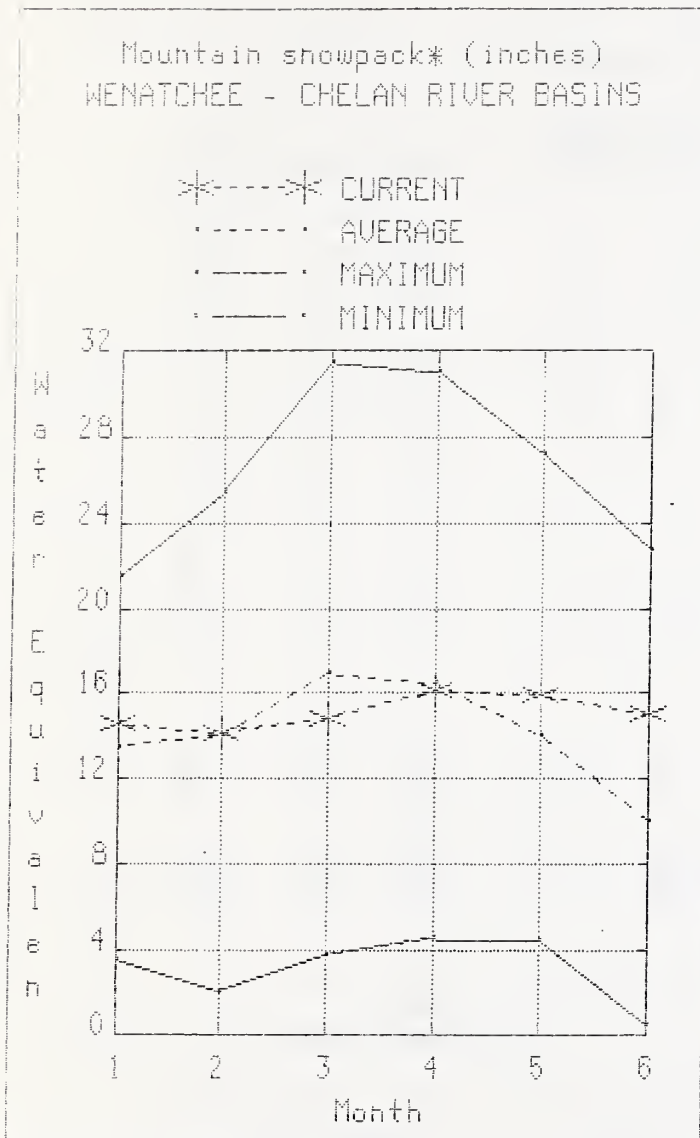
RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE : CAPACITY:	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF ----- LAST YR. AVERAGE
		THIS YEAR	LAST YEAR	AVG.			
CONCONULLY LAKE (SALMON)	10.5	10.2	9.1	9.0	Okanogan River	8	143 144
CONCONULLY RESERVOIR	13.0	11.0	11.7	9.0	Methow River	1	183 178

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.  
 ++ National Weather Service Earlybird forecast value.

The average is computed for the 1961-1985 base period.

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 (2) - The value is natural flow - actual flow may be affected by upstream water management.

# WENATCHEE AND CHELAN



**WATER SUPPLY OUTLOOK:** June 1 snowpack in the Wenatchee Basin is 132%, up from 102% of average and the Chelan Basin 182%, up from 144%. Reservoir storage in Lake Chelan is 547,400 acre feet or 121% of June 1 average and 81% of capacity. Lyman Lake SNOTEL had the most snow water with 84.4 inches of water, this site would normally have 47.6 inches. Runoff for the Entiat River is forecast to be 98% of normal for the summer. Summer forecasts for the Chelan River are for 120%, Wenatchee River's runoff 110%, and 72% on the Squilchuck-Stemilt. Streamflow for May on the Chelan River was 110% of average and the Wenatchee River was 94% of normal. Precipitation during May was 172% of normal in the basin and 146% for the year-to-date.

For more information contact your local Soil Conservation Service office.

# WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS								
FORECAST POINT	FORECAST PERIOD	<----- DRIER ----- FUTURE CONDITIONS ----- WETTER ----->						
		CHANCE OF EXCEEDING *					25 YR.	
		90% (1000AF)	70% (1000AF)	50% (MOST PROBABLE) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	(1000AF)
CHELAN RIVER at Chelan (1)	MAY-SEP	1080	1230	1290	120	1350	1500	1075
	MAY-JUL	940	1060	1120	120	1180	1300	931
	MAY-JUN	715	805	850	120	895	985	707
STEHEKIN R. at Stehekin	MAY-SEP	855	900	930	120	960	1010	775
	MAY-JUL	710	750	775	120	800	840	645
	MAY-JUN	525	550	570	121	590	615	473
ENTIAT RIVER nr Ardenvoir	MAY-SEP	183	200	215	99	230	245	217
	MAY-JUL	162	179	191	98	205	220	195
	MAY-JUN	129	143	152	98	161	175	155
WENATCHEE R. at Peshastin	MAY-SEP	1150	1440	1640	110	1840	2130	1489
	MAY-JUL	1030	1280	1460	110	1640	1890	1327
	MAY-JUN	795	995	1130	110	1270	1470	1027
STEMILT nr Wenatchee (miners in)	MAY-SEP	54	81	99	72	117	144	138
ICICLE CREEK nr Leavenworth	APR-SEP	270	340	390	105	440	510	370
	APR-JUL	250	315	360	106	405	470	340
	APR-JUN	197	250	285	106	320	375	270
COLUMBIA bl Rock Island Dam (2) ++	MAY-SEP	69700	73900	76800	118	79700	83900	65060
	MAY-JUL	57100	60600	63000	117	65400	68900	53860
	MAY-JUN	43000	45600	47400	117	49200	51800	40550
RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY:	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
CHELAN LAKE	676.1	547.4	455.5	450.6	Chelan Lake Basin	3	182	182
					Entiat River	1	0	0
					Wenatchee River	4	141	132
					Squilchuck Creek	0	0	0
					Stemilt Creek	0	0	0
					Colockum Creek	0	0	0

\* 90%, 70%, 50%, and 30% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.  
 ++ National Weather Service Earlybird forecast value.

The average is computed for the 1961-1985 base period.

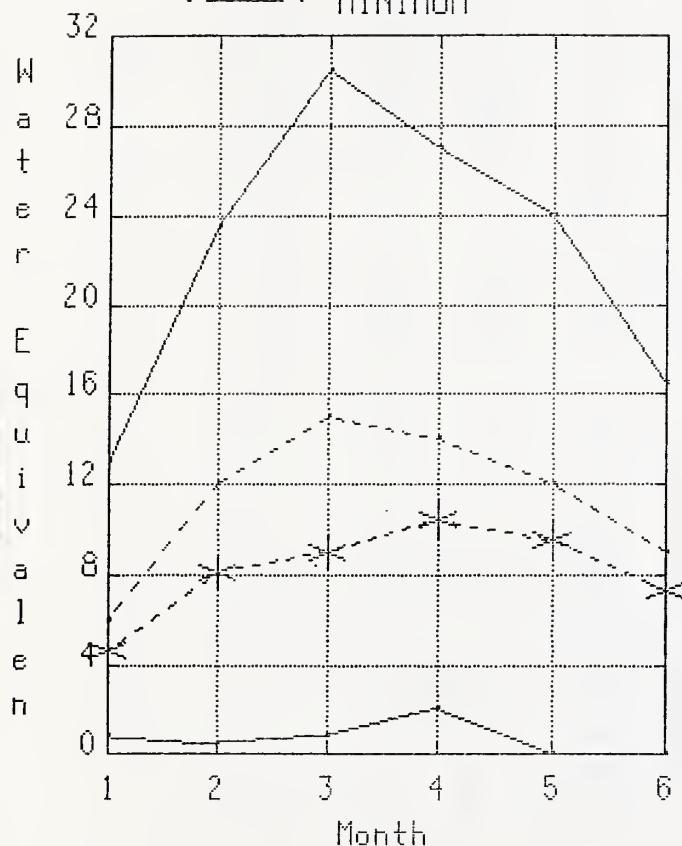
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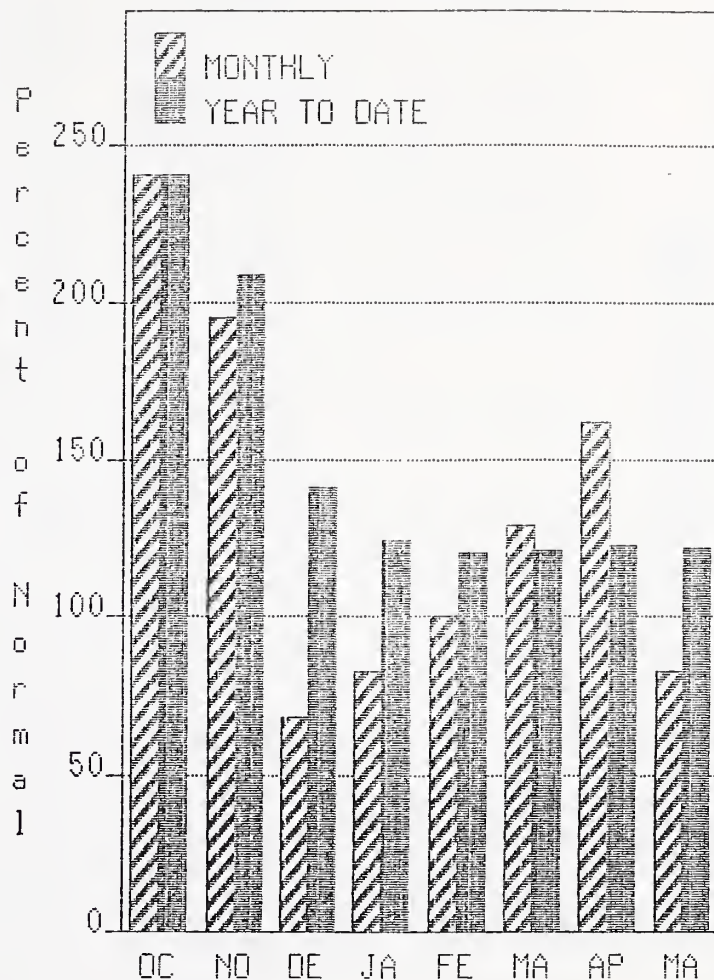
# YAKIMA

Mountain snowpack\* (inches)  
YAKIMA RIVER BASIN

\*---\* CURRENT  
..... AVERAGE  
——— MAXIMUM  
——— MINIMUM



Precipitation\* (percent of normal)  
YAKIMA RIVER BASIN



\*Based on selected stations

## WATER SUPPLY OUTLOOK:

June 1 summer streamflow forecasts for the Yakima Basin vary throughout the basin as follows: the Yakima River at Cle Elum, 76%; Naches River, 80%; the Yakima River at Parker, 78%; Ahtanum Creek, 74%, and American River 84%. May streamflows were below normal with the Yakima River at Parker 73% of normal, 85% on the Yakima near Cle Elum, and 78% on the Naches River. May precipitation was 79% of normal and 124% for the water year-to-date. The outlook for irrigation water for the summer is still good with June 1 reservoir storage for the five major reservoirs at 1,047,300 acre feet, 112% of average. June 1 snowpack is 82%, up from 80% of average on May 1, based upon 11 snow courses and SNOTEL readings. Temperatures were two degrees below average for May. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U. S. Bureau of Reclamation's forecast for the total water supply available which includes adjustments for reservoir operation and irrigation return flow.

For more information contact your local Soil Conservation Service Office.

## YAKIMA RIVER BASIN

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	<----- DRIER -----		FUTURE CONDITIONS		>----- WETTER ----->		25 YR. (1000AF)	
		CHANCE OF EXCEEDING *							
		90% (1000AF)	70% (1000AF)	50% (MOST PROBABLE) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)		
YAKIMA RIVER at Martin (1)	MAY-SEP	70	82	87	80	92	104	109	
	MAY-JUL	65	75	80	80	85	95	100	
	MAY-JUN	55	64	68	80	72	81	85	
YAKIMA RIVER at Cle Elum (2)	MAY-SEP	500	560	600	76	640	700	786	
	MAY-JUL	430	485	520	76	555	610	682	
	MAY-JUN	360	405	435	76	465	510	570	
YAKIMA RIVER nr Parker (2)	MAY-SEP	995	1180	1310	78	1440	1630	1682	
	MAY-JUL	875	1040	1150	78	1260	1430	1469	
	MAY-JUN	740	880	975	78	1070	1210	1250	
KACHESS RIVER nr Easton (1)	MAY-SEP	61	74	80	74	86	99	108	
	MAY-JUL	50	61	66	74	71	82	89	
	MAY-JUN	43	53	57	74	61	71	77	
CLE ELUM RIVER nr Roslyn (1)	MAY-SEP	245	285	305	78	325	365	393	
	MAY-JUL	220	260	275	78	290	330	353	
	MAY-JUN	180	210	225	78	240	270	289	
BUMPING RIVER nr Nile (1)	MAY-SEP	79	96	103	84	110	127	123	
	MAY-JUL	72	87	94	84	101	116	112	
	MAY-JUN	59	71	76	84	81	93	90	
AMERICAN RIVER nr Nile	MAY-SEP	77	85	90	84	95	103	107	
	MAY-JUL	69	76	81	84	86	93	97	
	MAY-JUN	57	62	66	84	70	75	79	
TIETON RIVER at Tieton (1)	MAY-SEP	131	161	175	82	189	220	213	
	MAY-JUL	109	134	145	82	156	181	177	
	MAY-JUN	84	103	112	82	121	140	136	
NACHES RIVER nr Naches (2)	MAY-SEP	480	540	580	80	620	680	726	
	MAY-JUL	425	480	515	80	550	605	645	
	MAY-JUN	350	395	425	80	455	500	533	
AHTANUM CREEK nr Tampico (2)	MAY-SEP	21	26	29	74	32	38	39	
	MAY-JUL	18.0	23	26	74	29	34	35	
	MAY-JUN	16.0	19.0	22	76	25	28	29	

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE : CAPACITY :	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
KEECHELUS	157.8	153.5	159.2	144.0	Yakima River	11	83	82
KACHESS	239.0	236.0	235.2	218.0	Ahtanum Creek	1	0	0
CLE ELUM	436.9	430.4	428.4	378.0				
BUMPING LAKE	33.7	31.6	31.3	27.0				
RIMROCK	198.0	195.8	195.5	167.0				

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1985 base period.

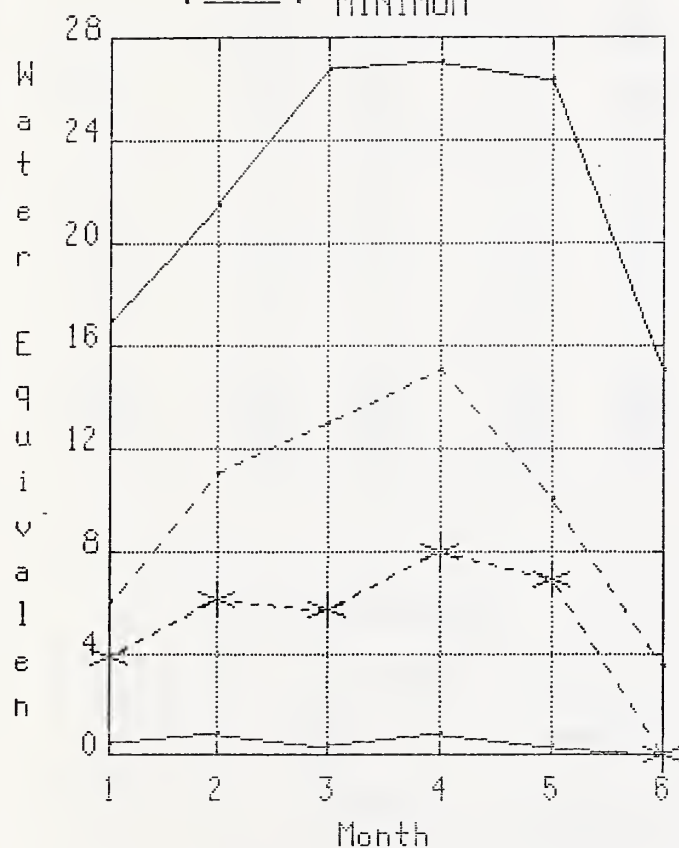
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

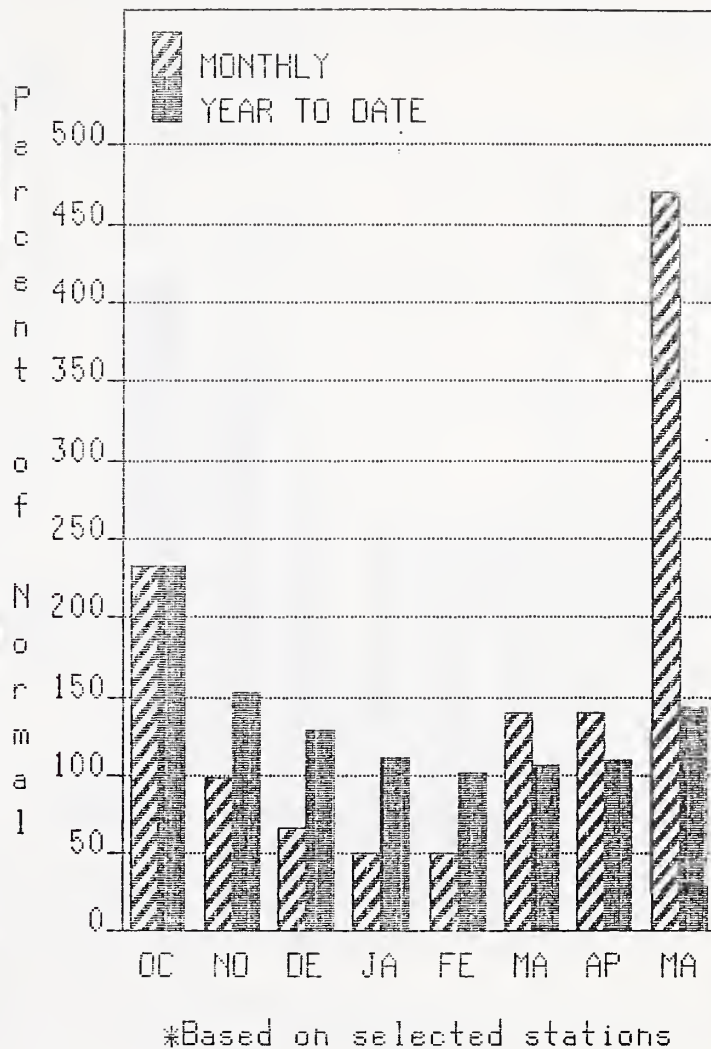
# WALLA WALLA

Mountain snowpack\* (inches)  
WALLA WALLA RIVER BASIN

\*---\* CURRENT  
..... AVERAGE  
——— MAXIMUM  
——— MINIMUM



Precipitation\* (percent of normal)  
WALLA WALLA RIVER BASIN



## WATER SUPPLY OUTLOOK:

Several large storms hit the Blue Mountains of southeastern Washington during May. May precipitation was 530% of average bringing the water year-to-date precipitation to 140% of normal. The forecast is for 85% of average streamflow in the Walla Walla River for the coming summer, the Grande Ronde, 57%; Snake River, 65%, and 76% for Mill Creek. May streamflow was 137% of normal on the Walla Walla River, 72% for the Snake River, and 110% on the Grande Ronde River near Troy. Snowpack was gone from the Touchet SNOTEL by May 25. Temperatures were three degrees below average for May.

For more information contact your local Soil Conservation Service office.



# WALLA WALLA RIVER BASIN

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	<div> <div>&lt;----- DRIER -----</div> <div>FUTURE CONDITIONS</div> <div>----- WETTER -----&gt;</div> </div>						
		CHANCE OF EXCEEDING *						25 YR. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (MOST PROBABLE) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
GRANDE RONDE at Troy (1) ++	JUN-JUL	295	385	425	85	465	555	499
	JUN-SEP	355	460	510	85	560	670	602
SNAKE bi Lower Granite Dam (1,2) ++	JUN-JUL	4890	6000	6510	62	7020	8130	10420
	JUN-SEP	6200	7610	8250	62	8890	10300	13239
MILL CREEK at Walla Walla	MAY-SEP	2.7	4.6	5.9	77	7.2	9.1	7.7
	MAY-JUL	2.5	4.4	5.7	76	7.0	8.9	7.5
	MAY-JUN	2.5	4.3	5.5	75	6.7	8.5	7.3
SF WALLA WALLA nr Milton Freewater	MAY-JUL	27	31	33	85	35	39	39
COLUMBIA R. at The Dalles (2) ++	MAY-SEP	76300	83200	87800	99	92400	99300	88790
	MAY-JUL	64200	69900	73800	100	77700	83400	74070
	MAY-JUN	50000	54400	57400	100	60400	64800	57430

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE :	** USEABLE STORAGE **			WATERSHED	NO.	THIS YEAR AS % OF
	CAPACITY:	THIS	LAST			COURSES	-----
		YEAR	YEAR	AVG.		AVG'D	LAST YR. AVERAGE
					Mill Creek	1	0 0

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

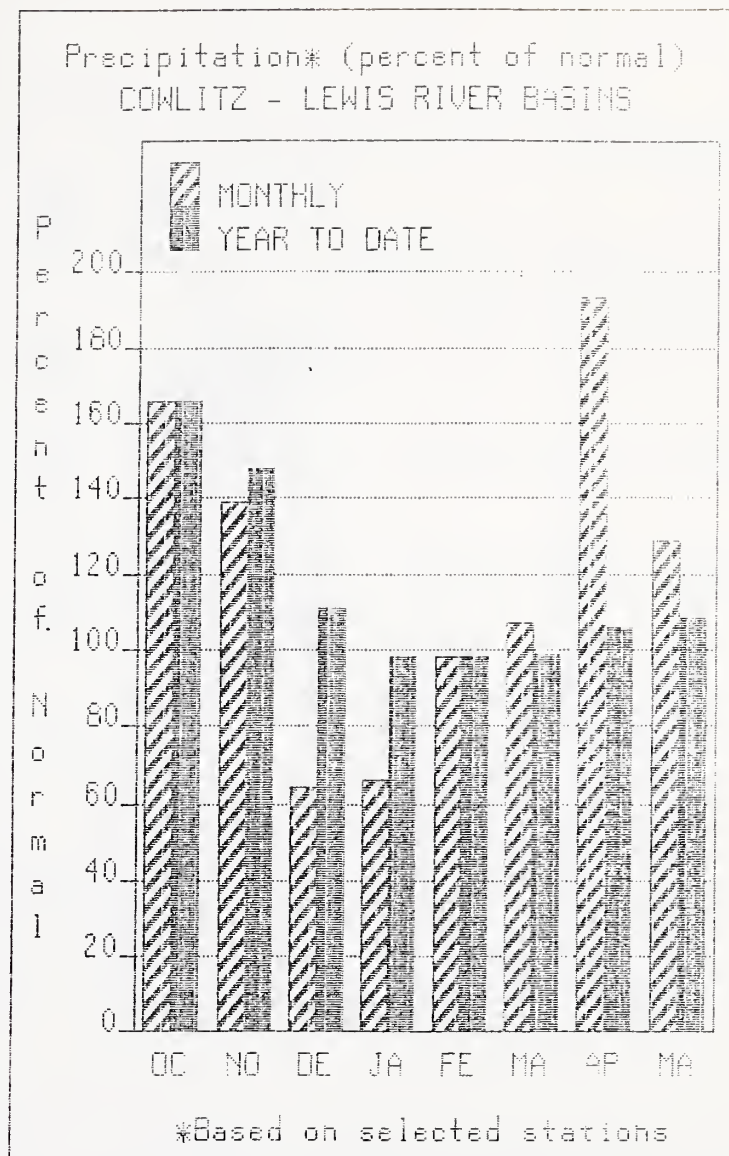
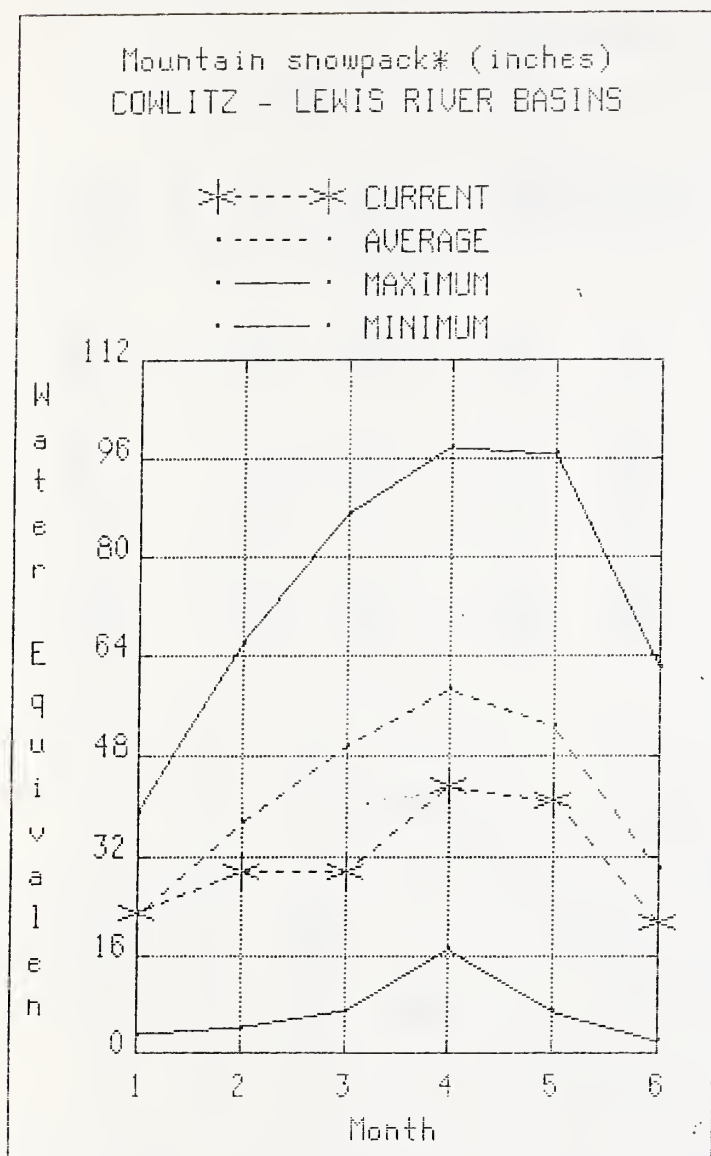
++ National Weather Service Earlybird forecast value.

The average is computed for the 1961-1985 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

# COWLITZ AND LEWIS



## WATER SUPPLY OUTLOOK:

May precipitation was 114% of normal, bringing the water year-to-date precipitation to 108% of average. June 1 snow cover for the Cowlitz-Lewis River Basin is 71%. The Paradise Park SNOTEL has the maximum snowpack water content for the basin with 78.2 inches, normal June 1 water content is 47.0 inches. Forecasts for summer runoff in the Lewis River are 85%, and for the Cowlitz River, 100%. May streamflow on the Cowlitz and Lewis rivers was 77% of average. Temperatures were two degrees below normal for May.

For more information contact your local Soil Conservation Service office.

# COWLITZ - LEWIS RIVER BASINS

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	<div> <div>&lt;----- DRIER -----</div> <div>FUTURE CONDITIONS</div> <div>----- WETTER -----&gt;</div> </div>						
		CHANCE OF EXCEEDING *						
		90%	70%	50% (MOST PROBABLE)		30%	10%	25 YR.
		(1000AF)	(1000AF)	(1000AF) (% AVG.)		(1000AF)	(1000AF)	(1000AF)
LEWIS RIVER at Ariel (2) ++	MAY-SEP	545	670	755	85	840	970	892
	MAY-JUL	435	590	660	90	730	835	732
	MAY-JUN	400	485	545	90	605	690	606
COWLITZ R. bl Mayfield Dam (2) ++	MAY-SEP	820	1280	1600	100	1920	2380	1604
	MAY-JUL	695	1080	1350	100	1620	2010	1350
	MAY-JUN	560	875	1090	100	1300	1620	1092
COWLITZ R. at Castle Rock (2) ++	MAY-SEP	1050	1650	2050	100	2450	3050	2050
	MAY-JUL	870	1360	1700	100	2040	2530	1706
	MAY-JUN	710	1110	1380	100	1650	2050	1378

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE :	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
	CAPACITY:	THIS	LAST				
		YEAR	YEAR	AVG.			
					Cowlitz River	5	90 92
					Lewis River	4	74 40

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.  
 ++ National Weather Service Earlybird forecast value.

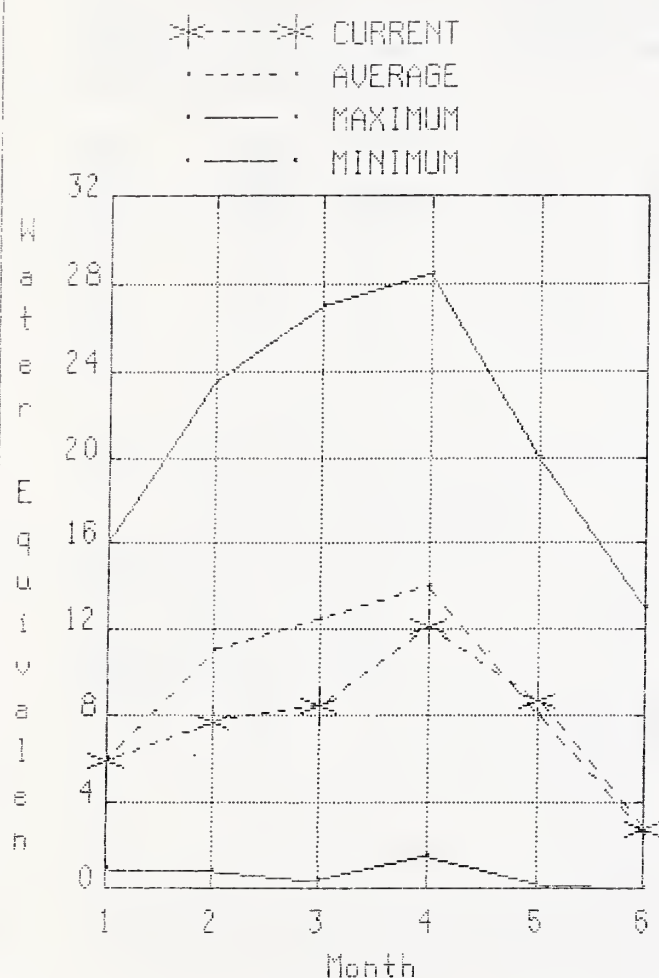
The average is computed for the 1961-1985 base period.

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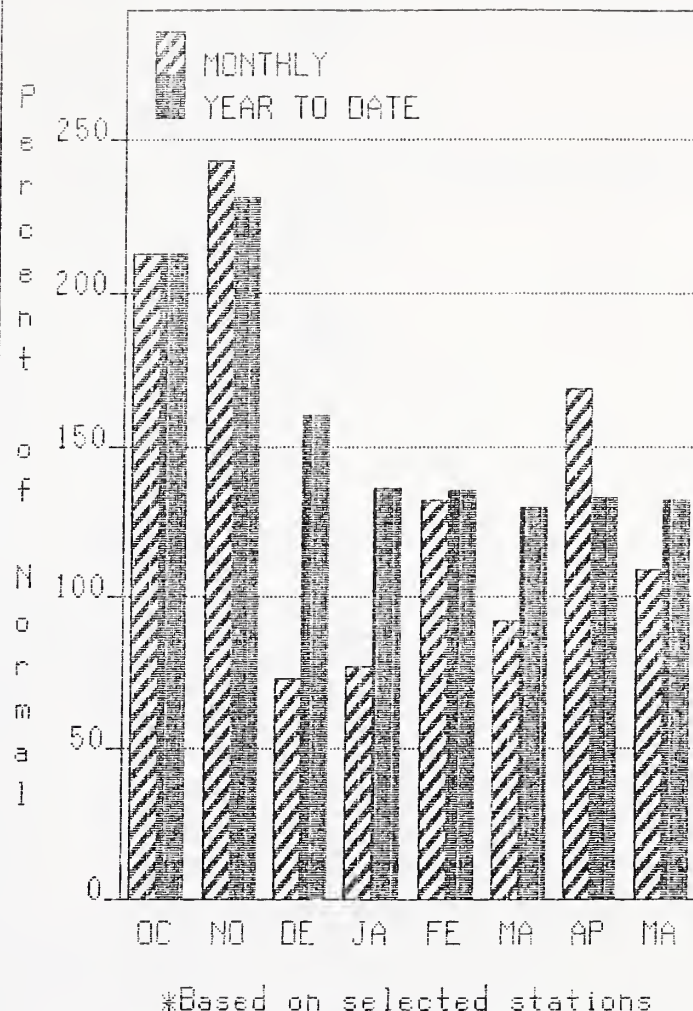


# WHITE - GREEN

Mountain snowpack\* (inches)  
WHITE - GREEN RIVER BASINS



Precipitation\* (percent of normal)  
WHITE - GREEN RIVER BASINS



## WATER SUPPLY OUTLOOK:

June 1 snowpack was 130% of normal on the White River and 28% in the Green Basin. May precipitation was 114% of normal, bringing the water year-to-date to 132% of average. Summer runoff is forecasted to be 93% on the Green River, and 102% on the Cedar River. Temperatures were one degree below average for May.

For more information contact your local Soil Conservation Service office.

# WHITE - GREEN RIVER BASINS

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	<----- DRIER ----- FUTURE CONDITIONS ----- WETTER ----->						
		CHANCE OF EXCEEDING *						
		90%	70%	50% (MOST PROBABLE)		30%	10%	25 YR.
		(1000AF)	(1000AF)	(1000AF) (% AVG.)		(1000AF)	(1000AF)	(1000AF)
GREEN R bl Howard Hanson Dam (2)	MAY-SEP	157	178	192	93	205	225	207
	MAY-JUL	135	153	165	93	177	290	177
	MAY-JUN	115	131	141	92	151	167	153
CEDAR RIVER nr Cedar Falls	MAY-SEP	63	70	75	101	80	88	74
	MAY-JUL	56	63	67	102	72	78	66
	MAY-JUN	46	51	55	102	59	64	54

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE :	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
	CAPACITY:	THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
					White River	2	128	130
					Green River	2	16	28
					Cedar River	0	0	0

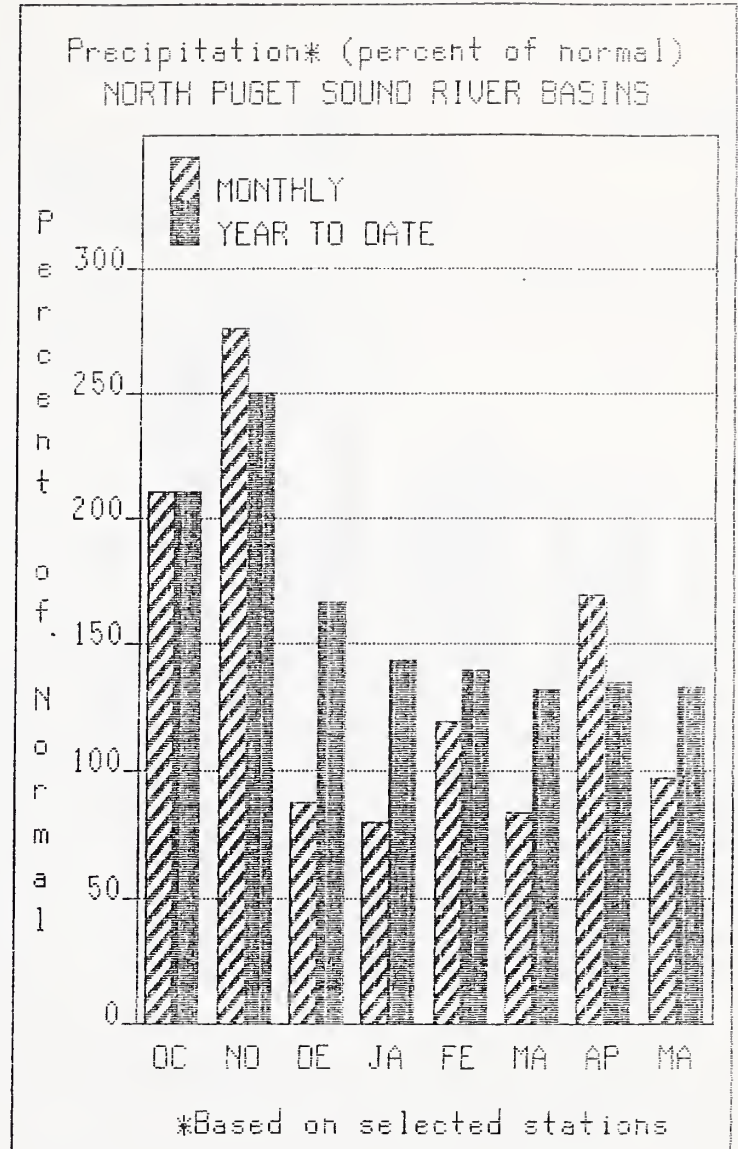
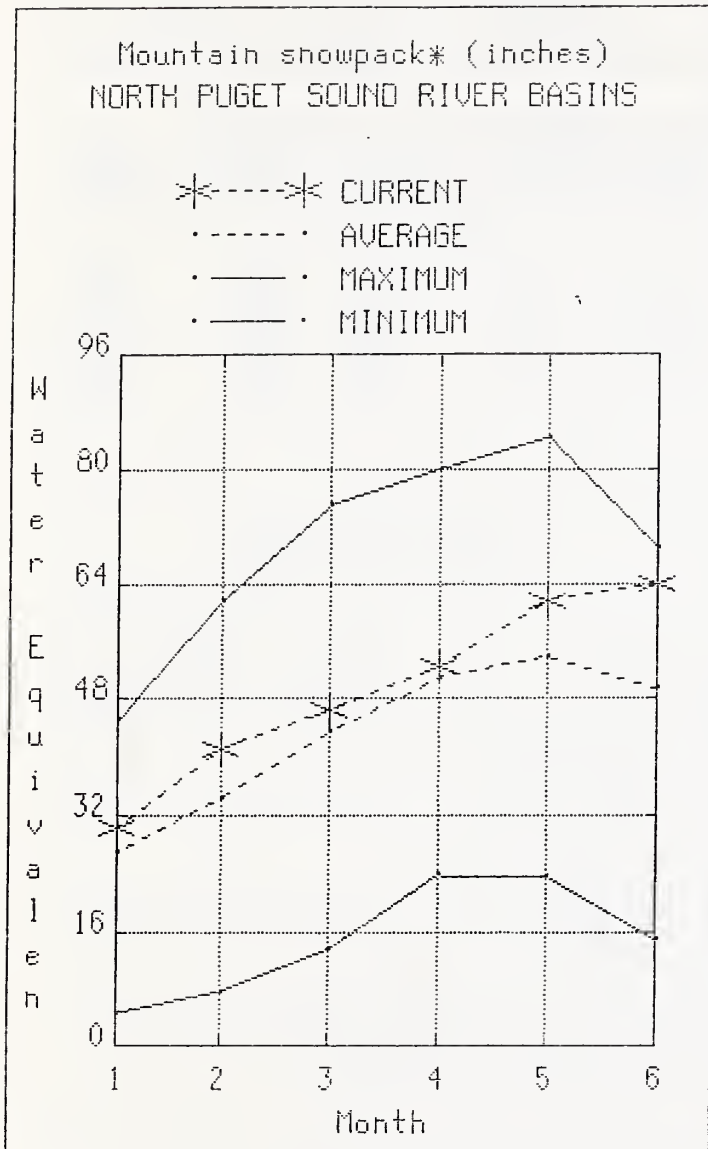
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# NORTH PUGET SOUND



## WATER SUPPLY

### OUTLOOK:

May streamflow in the Skagit River was 101% of average. Forecast for the Skagit River is 135% of normal for summer period. June 1 snow cover in the Skagit Basin is 175% of normal. Rainy Pass SNOTEL at elevation 4780 feet, has 44.2 inches of water content; normal May 1 water content is 26.4 inches. June 1 reservoir storage in Ross Lake is 84% of normal and 62% of capacity. Precipitation for May was 87% of average with a water year-to-date at 134% of normal. May temperatures were one degree below normal.

For more information contact your local Soil Conservation Service Office.



# NORTH PUGET SOUND RIVER BASINS

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	<div> <div>&lt;----- DRIER -----</div> <div>FUTURE CONDITIONS</div> <div>----- WETTER -----&gt;</div> </div>						
		CHANCE OF EXCEEDING *						
		90%	70%	50% (MOST PROBABLE)		30%	10%	25 YR.
		(1000AF)	(1000AF)	(1000AF) (% AVG.)		(1000AF)	(1000AF)	(1000AF)
SKAGIT RIVER at Newhalem (2)	MAY-SEP	2480	2670	2790	135	2910	3100	2062
	MAY-AUG	2350	2520	2640	138	2760	2930	1919
	MAY-JUL	2080	2230	2330	138	2430	2580	1689
	MAY-JUN	1820	1950	2040	137	2130	2260	1485

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
ROSS	1404.1	864.3	988.4	1033.7	Snoqualmie River	1	99	89
DIABLO RESERVOIR	90.6	89.0	86.3	86.1	Skykomish River	2	59	44
GORGE RESERVOIR	NO REPORT				Skagit River	3	165	175
					Baker River	0	0	0

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

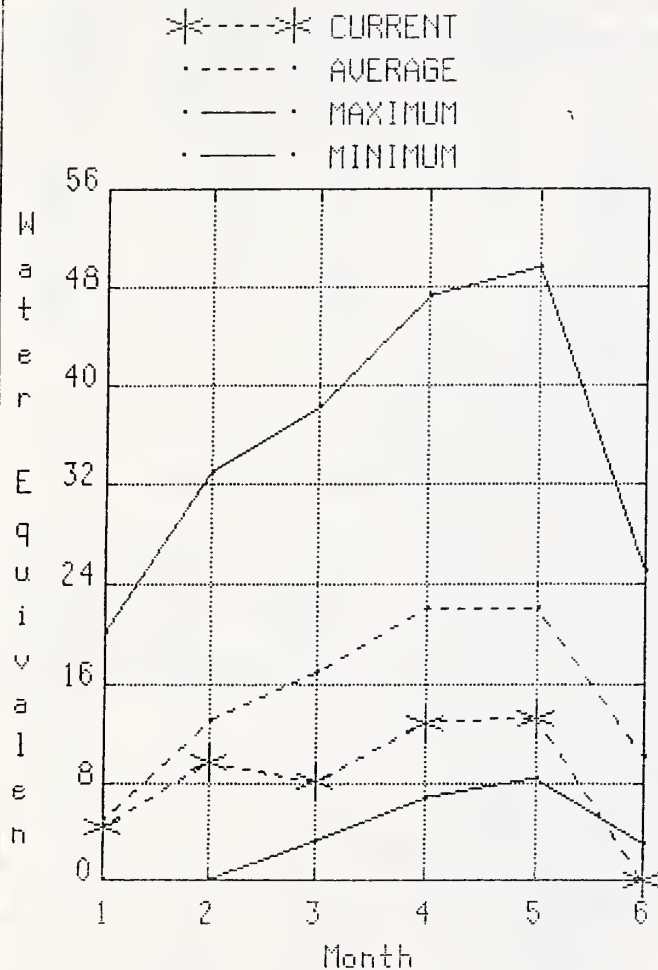
The average is computed for the 1961-1985 base period.

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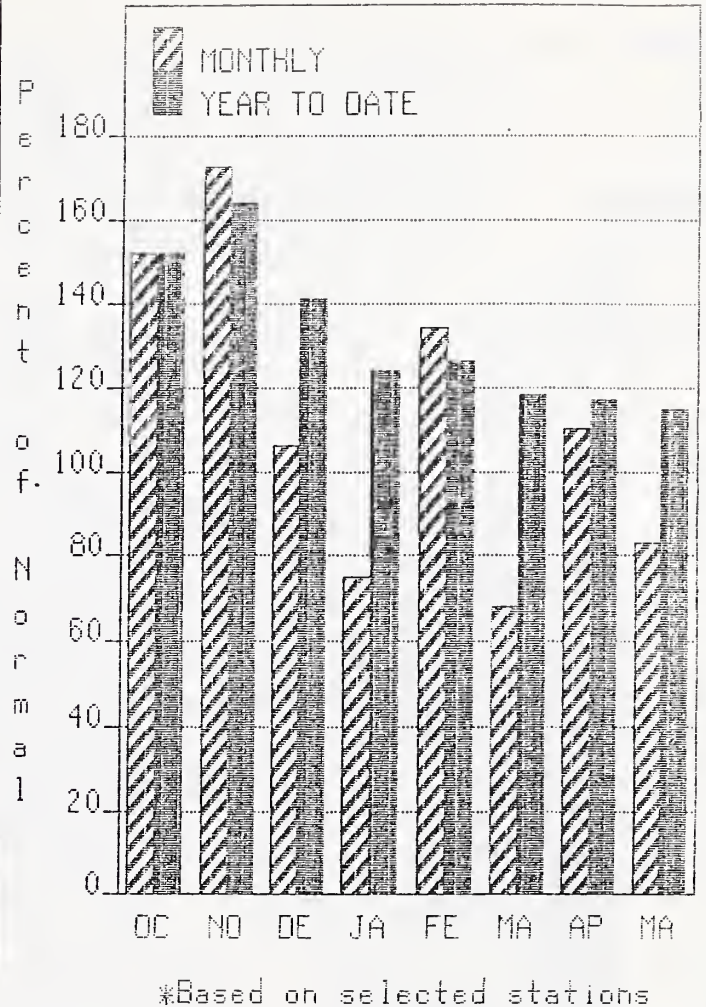
(2) - The value is natural flow - actual flow may be affected by upstream water management.

# OLYMPIC

Mountain snowpack\* (inches)  
OLYMPIC PENINSULA RIVER BASINS



Precipitation\* (percent of normal)  
OLYMPIC PENINSULA RIVER BASINS



## WATER SUPPLY OUTLOOK:

May precipitation was 90% of average, with water year-to-date precipitation accumulation at 114% of normal. Quillayute weather station reported 4.29 inches of precipitation during May. There were no snow course readings in the Olympics for June 1. The Mount Crag SNOTEL near Quilcene had lost its snowpack on May 31. May forecasts of runoff for streamflow in the basin are for 91% of average on the Dungeness River, and 83% for the Elwha River. The Big Quilcene can expect below normal runoff this summer. Temperatures were one degree below normal for May.

For more information contact your local Soil Conservation Service office.

# OLYMPIC PENINSULA RIVER BASINS

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	<----- DRIER ----- FUTURE CONDITIONS ----- WETTER ----->						
		CHANCE OF EXCEEDING *					25 YR.	
		90%	70%	50% (MOST PROBABLE)	30%	10%	(1000AF)	
		(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)	(1000AF)	
DUNGENESS RIVER nr Sequim	MAY-SEP	102	116	125 91	134	148	137	
	MAY-JUL	81	92	99 91	106	117	109	
	MAY-JUN	72	81	88 91	95	104	97	
ELWAHA RIVER nr Port Angeles	MAY-SEP	290	335	365 81	395	440	451	
	MAY-JUL	240	275	300 83	325	360	363	

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **		WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF
		THIS YEAR	LAST YEAR AVG.			LAST YR. AVERAGE
				Elwha River	0	0 0
				Morse Creek	0	0 0
				Dungeness River	0	0 0
				Quilcene River	0	0 0
				Wynoochee River	0	0 0

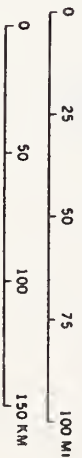
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JANUARY 1986 4-R-39641

# BASIN SUMMARY OF SNOW COURSE DATA

JUNE 1991

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
<b>PEND OREILLE RIVER</b>						
BUNCRGRASS MEADOWS	5000	6/01/91	---	5.6E	3.2	--
BUNCHGRASS HDWPILLW	5000	6/01/91	---	11.8	9.0	17.2
800000 BASIN	6050	6/01/91	---	41.0E	38.4	35.0
800000 CREEK	5900	6/01/91	---	37.9E	29.5	34.7
LOOKOUT	5140	5/30/91	20	10.8	9.8	12.1
SCREWITZER RIDGE	6200	6/01/91	---	28.5E	--	30.0
<b>KETTLE RIVER</b>						
BIG WHITE MTN CAN.	5510	5/31/91	22	10.9	3.7	8.9
FARRON CAN.	4000	5/28/91	0	.0	.0	.3
<b>COLVILLE RIVER</b>						
<b>ONAK LAKE, TWIN LAKES</b>						
<b>SPOKANE RIVER</b>						
LOOKOUT	5140	5/30/91	20	10.8	9.8	12.1
LOST LAKE	6110	6/01/91	---	53.0E	39.8	44.7
MOSQUITO RIDGE	5200	6/01/91	---	12.0E	16.2	16.5
MOSQUITO PILLW	5200	6/01/91	---	11.2	15.7	16.2
SUNSET	5540	6/01/91	---	22.5E	17.4	18.1
SUNSET PILLW	5540	6/01/91	---	25.4	19.8	19.7
<b>NEWMAN LAKE</b>						
QUARTZ PEAK PILLW	4700	6/01/91	---	.0	.0	--
<b>OKANOGAN RIVER</b>						
BRENDA MINE CAN.	4800	5/29/91	0	.0	--	.2
EMERBY CAN.	6200	5/30/91	93	46.8	44.3	39.0
GREYBACK RES CAN.	5120	5/27/91	0	.1	.0	.8
GAMILTON BILL CAN.	4890	6/02/91	0	.2	--	1.3
BARTS PASS PILLW	6500	6/01/91	---	63.7E	34.8	35.7
ISINTOK LAKE CAN.	5500	5/27/91	1	.2	--	1.2
LOST HORSE MTN CAN.	6300	5/30/91	27	11.3	7.6	4.0
MISSEZULA MTN CAN.	5090	6/02/91	0	.0	--	--
MISION CREEK CAN.	5800	5/30/91	46	22.3	18.3	13.6
MT. KOBAN CAN.	5900	5/30/91	11	3.7	3.2	5.0
SALMON HDWS PILLW	4500	6/01/91	---	.0E	.0	--
SILVER STAR MTN CAN.	6000	5/26/91	42	23.1	17.1	16.9
WHITE ROCKS MTN CAN.	6000	5/31/91	17	8.0	.0	9.3
<b>METHOW RIVER</b>						
BARTS PASS PILLW	6500	6/01/91	---	63.7E	34.8	35.7
SALMON HDWS PILLW	4500	6/01/91	---	.0E	.0	--
<b>CHELAN LAKE BASIN</b>						
LYMAN LAKE PILLW	5900	6/01/91	---	84.4E	53.8	47.6
MINERS RIDGE PILLW	6200	6/01/91	---	67.6E	50.6	--
PARK CK RIDGE PILLW	4600	6/01/91	---	25.7E	2.6	10.8
RAINY PASS PILLW	4780	6/01/91	---	44.2E	28.2	26.4
<b>ENTIAT RIVER</b>						
POPE RIDGE PILLW	3540	6/01/91	---	.0E	.0	.0
<b>WENATCHEE RIVER</b>						
BLEWETT PASS#2PILLW	4270	6/01/91	---	.0E	.0	.0
FISH LAKE PILLW	3370	6/01/91	---	.0E	10.0	.0
LYMAN LAKE PILLW	5900	6/01/91	---	84.4E	53.8	47.6
STEVEN'S PASS PILLW	4070	6/01/91	---	14.4E	6.1	27.5
TROUGS #2 PILLW	5310	6/01/91	---	.0E	.0	--
UPPER WHEELER PILLW	4400	6/01/91	---	.0E	.0	--
<b>STENILT CREEK</b>						
UPPER WHEELER PILLW	4400	6/01/91	---	.0E	.0	--

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
<b>COLOCUM CREEK</b>						
TROUGH #2 PILLW	5310	6/01/91	---	.0E	.0	--
<b>YAKIMA RIVER</b>						
BLEWETT PASS#2PILLW	4270	6/01/91	---	.0E	.0	.0
BUNPING RIDGE PILLW	4600	6/01/91	---	7.2E	8.1	.0
CORRAL PASS PILLW	6000	6/01/91	---	33.1E	31.4	24.9
FISH LAKE PILLW	3370	6/01/91	---	.0E	10.0	.0
GREEN LAKE PILLW	6000	6/01/91	---	1.5E	.0	.0
GROUSE CAMP PILLW	5380	6/01/91	---	.0E	.0	.0
MORSE LAKE PILLW	5400	6/01/91	---	39.6E	25.4	31.2
OLALLIE MOWS PILLW	3960	6/01/91	---	35.8E	36.2	40.3
SASSE RIDGE PILLW	4200	6/01/91	---	.0E	4.2	23.0
STAMPEDE PASS PILLW	3860	6/01/91	---	3.9E	25.1	13.9
WHITE PASS ES PILLW	4500	6/01/91	---	1.0E	6.1	15.2
<b>ASTANUM CREEK</b>						
GREEN LAKE PILLW	6000	6/01/91	---	1.5E	.0	.0
<b>MILL CREEK</b>						
BIGS RIDGE PILLW	4980	6/01/91	---	.0E	.3	.0
TOUCSET #2 PILLW	5530	6/01/91	---	.0E	--	.0
<b>LEWIS - COMLITZ RIVERS</b>						
JUNE LAKE PILLW	3200	6/01/91	---	.0E	.0	.0
LOME PINE PILLW	3800	6/01/91	---	9.0E	10.8	18.2
PARADISE PARK PILLW	5500	6/01/91	---	78.2E	--	47.0
PIGTAIL PEAK PILLW	5900	6/01/91	---	56.0E	47.0	34.1
POTATO BILL PILLW	4500	6/01/91	---	.9E	.0	.0
SEEP CANYON PILLW	4050	6/01/91	---	6.0E	17.9	20.0
SPENCER HDW PILLW	3400	6/01/91	---	.0E	.0	.0
SPIRIT LAKE PILLW	3100	6/01/91	---	.0E	.0	.0
SUPRIBE LKS PILLW	4250	6/01/91	---	9.5E	14.2	27.8
WHITE PASS ES PILLW	4500	6/01/91	---	1.0E	6.1	15.2
<b>WHITE RIVER</b>						
CORRAL PASS PILLW	6000	6/01/91	---	33.1E	31.4	24.9
MORSE LAKE PILLW	5400	6/01/91	---	39.6E	25.4	31.2
<b>GREEN RIVER</b>						
COUGAR MTN. PILLW	3200	6/01/91	---	.0E	.0	.0
GRASS MOUNTAIN #2	2900	6/02/91	0	.0	.0	--
LESTER CREEK	3100	6/02/91	0	.0	.0	--
LYNN LAKE	4000	6/02/91	4	1.8	.0	--
SAWMILL RIDGE	4700	6/02/91	13	6.3	4.8	--
STAMPEDE PASS PILLW	3860	6/01/91	---	3.9E	25.1	13.9
TWIN CAMP	4100	6/02/91	0	.0	.0	--
<b>SNOQUALMIE RIVER</b>						
KROMONA MINE	2400	6/29/91	0	.0	.0	--
OLALLIE MOWS PILLW	3960	6/01/91	---	35.8E	36.2	40.3
OLNEY PASS	3250	5/29/91	0	.0	.0	--
<b>SKYKOMISS RIVER</b>						
STAMPEDE PASS PILLW	3860	6/01/91	---	3.9E	25.1	13.9
STEVEN'S PASS PILLW	4070	6/01/91	---	14.4E	6.1	27.5
<b>SKAGIT RIVER</b>						
BARTS PASS PILLW	6500	6/01/91	---	63.7E	34.8	35.7
LYMAN LAKE PILLW	5900	6/01/91	---	84.4E	53.8	47.6
RAINY PASS PILLW	4780	6/01/91	---	44.2E	28.2	26.4
<b>QUILCENE RIVER</b>						
MOUNT CRAG PILLW	4050	6/01/91	---	.0E	.0	--





